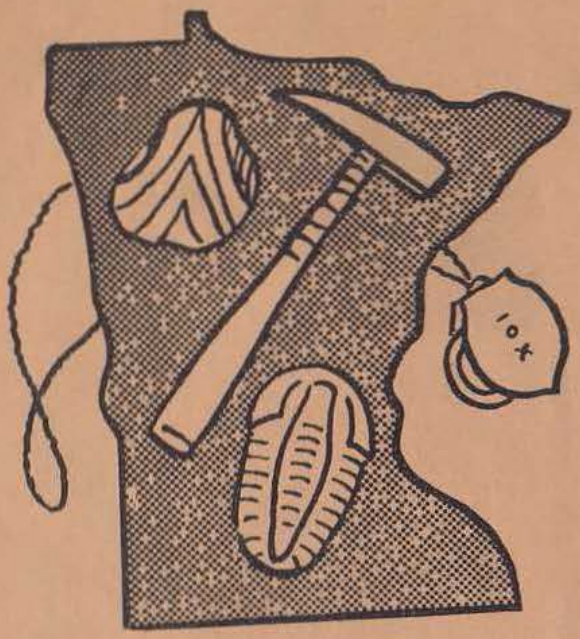
Summer 1982



NEWS

Geological Society of Minnesota

MINNEAPOLIS, MINNESOTA

FIRST CLASS

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GEOLOGICAL SOCIETY OF MINNESOTA

The President Notes

Every geologist amatuer or professional, knows that things don't just happen As we sack up and display our more manageable prizes or capture the immovable objects on film, we suspect unseen forces at work.
Knowing the cause(s) enriches the product. In recognition of some very worthy products, gemstone "awards" are due some of GSM's "invisible" forces. They are:

- -Marcia Gunville and the 1981-82 Program Committee of Jay Hutchinson, Mary Kimball, Dwight Robinson and Dick Uthe for hammering out a superlative Lecture Program this past year.
- -Dale and Wilma Johnson for the steady and reliable flow of coffee and donuts during the lectures.
- -Dick Uthe and his workshop committee of Sr. Joan Kain and Bob Handschin. Not only was the workshop excellent, it went on despite all weather to the contrary.
- -Dale Johnson for his audit of GSM finances and helpful financial advice.
- -Marjorie McGladery and her committee of Conrad Nelson and Marlys Lowe for able handling 1982 membership and roster.
- -Hank Gangl for procurment of GSM's first official typewriter.
- -Ethel Shimek and her rotating crew of newsletter helpers.
- -Dorothy Jefferys and Marcia Gunville for negotiating an excellent Spring Banquet.
- -All the Board Members for their ongoing commitment to GSM in all of its manifestations

Special thanks for worthy products to worthy people - gemstones all. I'm happy to report that these forces are still at work and there is one more that deserves special note namely Bob Gunville. For the results of his handiwork, check out the 1982 Field Trip Series. If past performance is any indication (and there's plenty of data from previous years), we're set for a great summer field season. I hope to see you there

Dwight Robinson

FIELD TRIPS

Final arrangements are being made for the summer field trips. Each trip will be a unique experience with leaders of exceptional quality. They will give everyone from beginners to the more knowledgeable members a fine opportunity to learn about their areas.

1. Sat., June 5 -- Early and Middle Precambrian Rocks of East-Central Minnesota led by Dr. G. B. Morey, Minnesota Geological Survey (by car)

The Early and Middle Precambrian rocks in and around the St. Cloud area represent an important aspect of Minnesota's geology. Here there are scattered remnants of the Archean granite-gneiss terrain and the Proterozoic rocks superimposed on them by later events. Dr. Morey has led us on trips to this highly complex area before, and will continue to interpret it for us. He will illustrate how he deduces from these rocks portions of the geologic history he has been outlining in his lecture series.

2. Sat., Sun., June 19-20 -- The Ancient Rocks of the Minnesota River Valley led by Dr. Paul Weiblen, Univ. of Minn. (by bus, overnight at a motel)

We will see some of the oldest rocks on the North American continent as they are displayed in a narrow band of the Minnesota River Valley from Franklin to Montevideo. This small strip of rocks was unearthed 10,000 years ago by Glacial River Warren, but was formed during Minnesota's early history about 3600 to 1800 million years ago. Dr. Weiblen is a petrologist who can describe for us the many processes involved in their mineralization and metamorphism which indicate significant periods of Minnesota's Archean past.

3. Sat., July 10 -- The Volcanics of the Late Precambrian Rift System Exposed at Taylor's Falls led by Dr. David Southwick, Minnesota Geological Survey (by car)

About 1100 million years ago the North American continent started to rift apart, forcing volcanic materials to rise up into a narrow band from Lake Superior to Kansas. Dr. Southwick will show us how these ancient lavas covered the Taylor's Falls area in successive flows. We will examine their many structures, and their stratigraphic relationships with the younger sedimentary rocks exposed in the St. Croix River Valley. We will see how recent glacial events finally sculptured the entire river valley and formed the potholes which characterize this segment of the river today.

4. Sat., Sun., July 31-Aug. 1 -- The Iron Ores of the Mesabi Range and Their Related Geology led by Dr. Ralph Marsden, Univ. of Minn. Duluth (by car, overnight at U.M.D.)

Dr. Marsden is an expert on Minnesota's iron formations who will explain to us how these highly rich ores were formed, and how they are being mined and processed today. This trip will include a background briefing and tours through a mine and taconite plant, as well as looking at the associated Middle Precambrian rocks. We will seek an understanding of the events almost 2 billion years ago which created this valuable resource.

People on the field trip list will receive final details of each trip by phone. If you would like your name included, please contact Bob Gunville, Field Trip Chairman at 574-1421.

HINTS FOR FIELD TRIPPERS

Since our field trips are primarily for working rather than sight seeing, the following suggestions are offered:

1 / Clothing: Casual and practical, preferably layers that can be added or removed for maximum comfort; comfortable walking shoes or boots. Plastic rain coat and hood.

2 / Equipment: Plastic bags, masking tape, pens, note book, geologists hammer.

3 / Food and drink: We always have lunch in the field. Bring drinking water as well as other beverage. Busses do not have drinking water.

4 / Optional items: Camera, field glasses, hand lense, rain boots. Rock or fossil identification guides.

5 / Overnight: In addition to usual items, plan for more meals in the field with canned or dry foods that do not need refrigeration.

6 / Plan to spend the whole day; schedules tend to be flexible. We will return when we arrive.

Note: Minnesota Geological Survey has some booklets on mineral and fossil collecting.

"I BECAME INTERESTED IN GEOLOGY WHEN MY MARRIAGE WENT ON THE ROCKS!"

MINNESOTA ROCKS COULD HOLD URANIUM

BY Marcia Gunville

Energy -- our way of life in the future depends on it. We know we must have energy and that oil, our largest source today, is running out.

These are the simple facts that future planners are facing. They are looking hard at all the possible alternatives to oil.

Nuclear energy is one such alternative, despite all its present problems. Uranium is the fuel. Should nuclear energy be called upon, there is a small chance that Minnesota could have a role in supplying the needed uranium.

Geologists have been looking for uranium ore in Minnesota since 1949 when the Atomic Energy Commission was stimulating production for its weapons program. So far their search has not been successful, but they know the right geological settings are here. Interest in Minnesota's uranium potential increases whenever world market needs expand.

Uranium exists almost everywhere on the earth's crust, but only in minute concentrations. It is present in most rocks. It is part of the soils. It is found dissolved in the groundwater and flowing in streams. Uranium ore deposits, however, are uncommon, forming only under very specializeed sets of geological circumstances.

Deciding where to look for uranium is itself a long process. Dr. G.B. Morey, Associate Director of the Minnesota Geological Survey, describes this process as having had several steps. First, proven deposits had to be located, either by prospectors who searched more or less randomly or by scientists who made more knowledgeable conjectures.

Next, many proven uranium deposits were closely studied to learn why the ore occurs where it does. Geological characteristics of the rocks associated with them were defined, evaluated, and organized into geologic environments. This information was then used to establish a detailed set of criteria for locating similar environments in areas where no known deposits occur.

These recognition criteria can now be used to find new target areas with geologic characteristics favorable for uranium exploration. Even then, only a very small percentage of the favorable sites contain profitable ore.

Uranium can occur in a bewildering variety of geological settings. But, according to Morey, these local differences can be broadly grouped into only two main types of geologic circumstances. One, deep within the earth, involves the rising of molten rock and heated fluid through the earth's crust. During this upward migration process, uranium, as well as other important metals, becomes concentrated and is precipitated either in the cracks and veins in the earth's crust or within larger rock bodies.

The other circumstance takes place at or near the earth's surface. It involves the weathering of rocks, and the erosion and deposition of the sediments thus produced. Uranium can be leached out of the rocks, carried away in the groundwater in an oxidized form, and reprecipitated later if conditions are favorable. Generally this involves contact with reducing agents such as residues of fossilized organic material within the rocks.

Geological settings in several parts of Minnesota are similar to those of uranium-rich areas in other parts of the world. Minnesota has had an extremely long, complex geological history, with many periods in the past when circumstances for concentrating uranium could have been present. However, this does not mean that mineable uranium is here. Still, conditions here are considered promising. Exploration activity has taken place in several parts of the state.

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Sloan - Speaker at Banquet

Members who attended our spring banquet were privileged to hear an outline of a timely study Dr. Robert Sloan is preparing on the origin of mammals. With drawings, pictures and charts as well as samples of fossils, he gave us a summary of the enormous amount of evidence of the many species which evolved from reptiles, some of which became mammals. The event was a fitting climax to our lecture series.

We are eagerly awaiting Sloan's account of the search for our ultimate ancestors as the scientific refutation of the claims being propounded by the Creationists.

Special thanks to Mark and Dorothy Jefferys, social activities chairs for their efforts in arranging the banquet. Fifty-nine people attended and several more came later for the talk.

Bob Handschin

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Worthy of Note

An article entitled " The History of Astronomy at the University of Minnesota" which appeared in the May-June issue of Encounters Magazine ; was written by Rod Nerdahl. and Donald Marion. Rod is an active GSM member. The article tells how small beginnings laid the foundation for today's work in astrophysics.

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Bob Handschin reports that the Elder Hostel Program which is designed for persons 60 and over) is offered this year at some 500 colleges and universities in the U.S. and Canada. Forty six offer courses in geology and forty in astronomy. Elder Hostels hve one week on campus sessions offering three courses, and some have several sessions.

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WORKSHOP A SUCCESS

Our 1982 workshop, held on April 3rd at the Van Cleve Recreation Center, was a most interesting experience. A sudden return of mid-winter blizzard conditions kept attendance down to a lucky 16. Two inches of blowing snow on top of ice with winds gusting up to 60 mph made driving scary even for Minnesotans.

Some aspects of regional geology as seen in our national parks was the theme of the program organized by Dick Uthe,chairman. H gave an overview of North American physiographic provinces and their regional geologic settings.

Next Bob and Marcia Gunville illustrated their talks on Yellowstone, Grand Tetons and the northern Rockies with their excellent slides. Sr. Joan Kain ... discussed the St. Croix National Scenic Riverway and paleozoic stratigraphy and fossils. Jay Hutchinson gave a slide talk on Hawaii and its volcanic history. Those who attended were: Grace Benz, Pearl Downey, Henry Gangl, Bob and Marcia Gunville,Olga Hallberg, Bob Handschin, Jay Hutchinson, Sr. Joan Kain, Frank Larimore, Bill Miller, Peggy Nemitz, Clarence Ooten,Dwight Robinson, Eva Selander,and Dick Uthe.

Bob Handschin

Looking Ahead

Minnesota State Fair

Beginning August 26th, our booth in the Education Building will need three volunteers each day for 12 days. The stint at the booth is interesting and provides an opportunity to see the Fair as well.

Exhibiting at the Fair is our main Publicity activity. It gives us a chance to acquaint a lot of people with our programs in geology. Many of you have learned about GSM at the Fair, and many can do their bit this way. To volunteer, Call Alex Lowe 451 6853.

Next...

Sept. 27 Annual Meeting includes elections of board members and review of field trips and preview of lectures.

Oct. 11 Lectures begin and continue on second and fourth Mondays.

Minnesota Rocks con 't

The Minnesota Geological Survey has been actively studying Minnesota's prospects for uranium. Morey states that there appears to be at least three general areas in the state which could contain economic deposits. He describes portions of Carlton and Pine counties in east-central Minnesota as comprising one of these areas. Here surface processes occurring almost two billion years ago could have concentrated uranium.

He also considers parts of southwestern Minnesota as another favorable region, especially in Murray, Nobles and Cottonwood counties. Ore could have been formed here by surface processes taking place as much as 1.6 billion years ago. The geology of these two areas resembles that of known ore deposits in northern Australia and in Saskatchewan, Canada.

The third part of the state listed by Morey as a potential uranium source is situated around the Northwest Angle in northern Minnesota where the rocks are older than 2 billion years. Here molten rock was involved in deep-seated processes similar to those of active mining areas in Colorado.

Despite all of the activity by mining companies in Minnesota, at this time no deposits of economic grade have been found. About 40 test holes have been drilled in Carlton and Pine counties. Testing has also taken place near Fulda in southwestern Minnesota. The lack of success so far has been discouraging for the mining companies involved. However, uranium ore deposits commonly localize in relatively small areas, even in favorable geologic settings.

Furthermore, the last Ice Age has left a large obstacle to Minnesota's mineral exploration. Much of the bedrock here, including possible uranium ore, lies buried under a thick cover of glacial drift that makes it difficult, if not impossible, to study the mineral potential. Only ten per cent of Minnesota's bedrock is exposed at the surface. There is every reason to believe that the buried rocks could also be suitable sources for uranium.

Even if large uranium deposits should be found, much would need to be done before mining in Minnesota could be considered. There are environmental, social, political, legal and economic questions to be decided. But the specter of future energy shortages and the problems related to dependence on foreign sources will keep geologists looking for it.

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Staff: Dwight Robinson, Bob Handschin, Bob and Marcia Gunville, contributors: Eva Selander, typing; James Erickson, art; Fern Belle Frost and Conrad Nelson, mailing.